CC Technical Documentation
NPM-10 (3595) Series Transceivers

Troubleshooting - BB

Issue 2 03/2004
Confidential ©2004 Nokia Corporation

Contents Page

Baseband Testpoints 3
Fault-Finding Charts 3
Phone is Dead 4
Flash Programming Does Not Work 6
Power Does Not Stay on or Phone is Jammed 7
Display Information: "Contact Service" 8
Phone Does Not Register Onto the Network, or the Phone Cannot Make a Call 9
SIM-related Faults 10
Insert SIM Card Fault 10
SIM-Card Rejected 11
Audio-related Faults 12
Charging Failure 15

 ©2004 Nokia Corporation Confidential

Baseband Testpoints

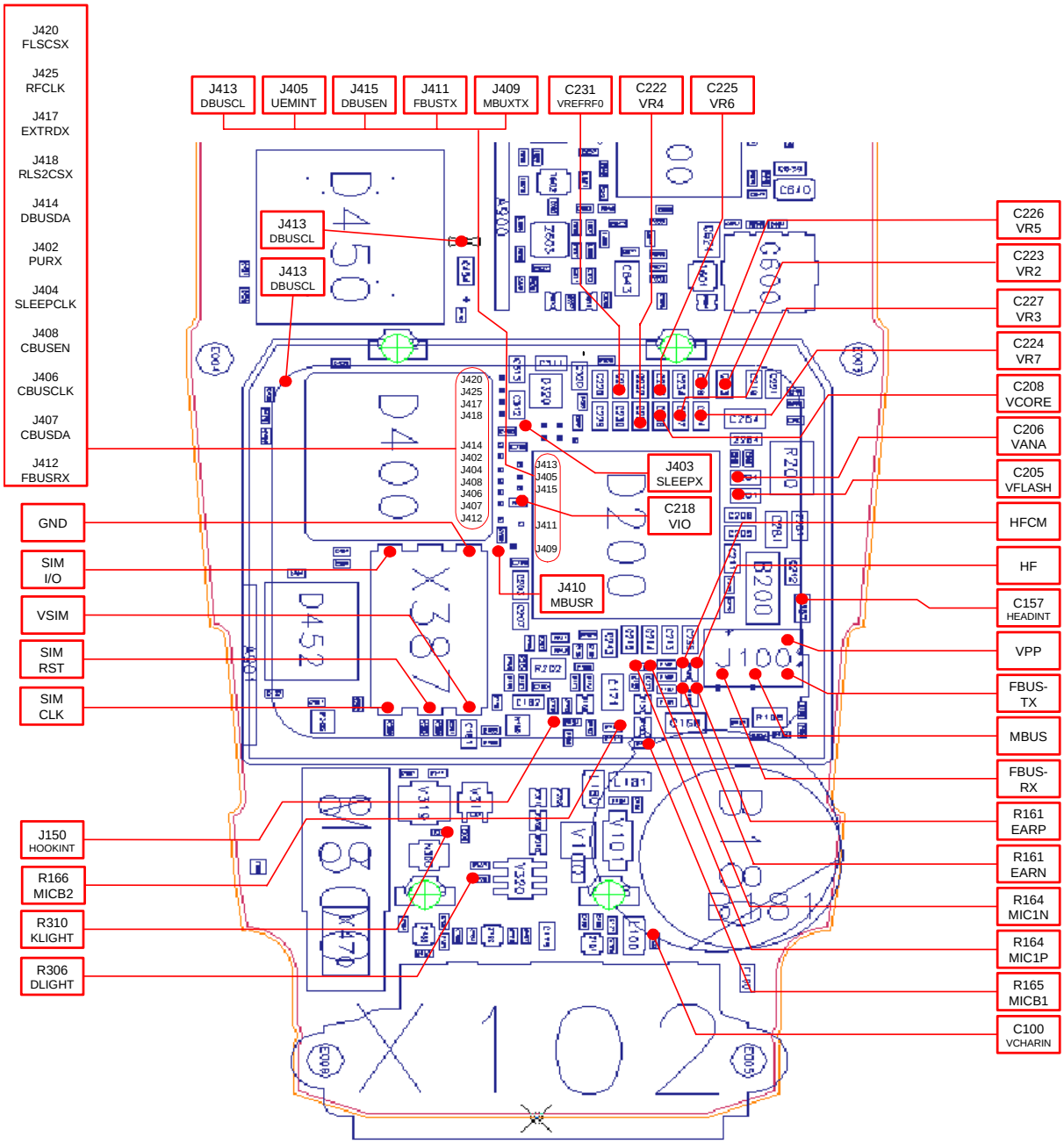

Figure 1: Baseband testpoints

Fault-Finding Charts

In this section, fault-finding charts are provided for the most common NPM-10 (3595) errors.

Note: Since both D200 (UEM) and D400(UPP) are underfilled, they cannot be replaced. If either D200 or D400 is defective, the entire PWB has to be discarded.

©2004 Nokia Corporation Confidential

Phone is Dead

This means that the phone does not draw any current at all when a supply is connected and/or the power key is pressed. It is assumed that the voltage supplied is 3.6 VDC. The UEM prevents any functionality whatsoever at battery/supply levels below 2.9 VDC.

©2004 Nokia Corporation Confidential

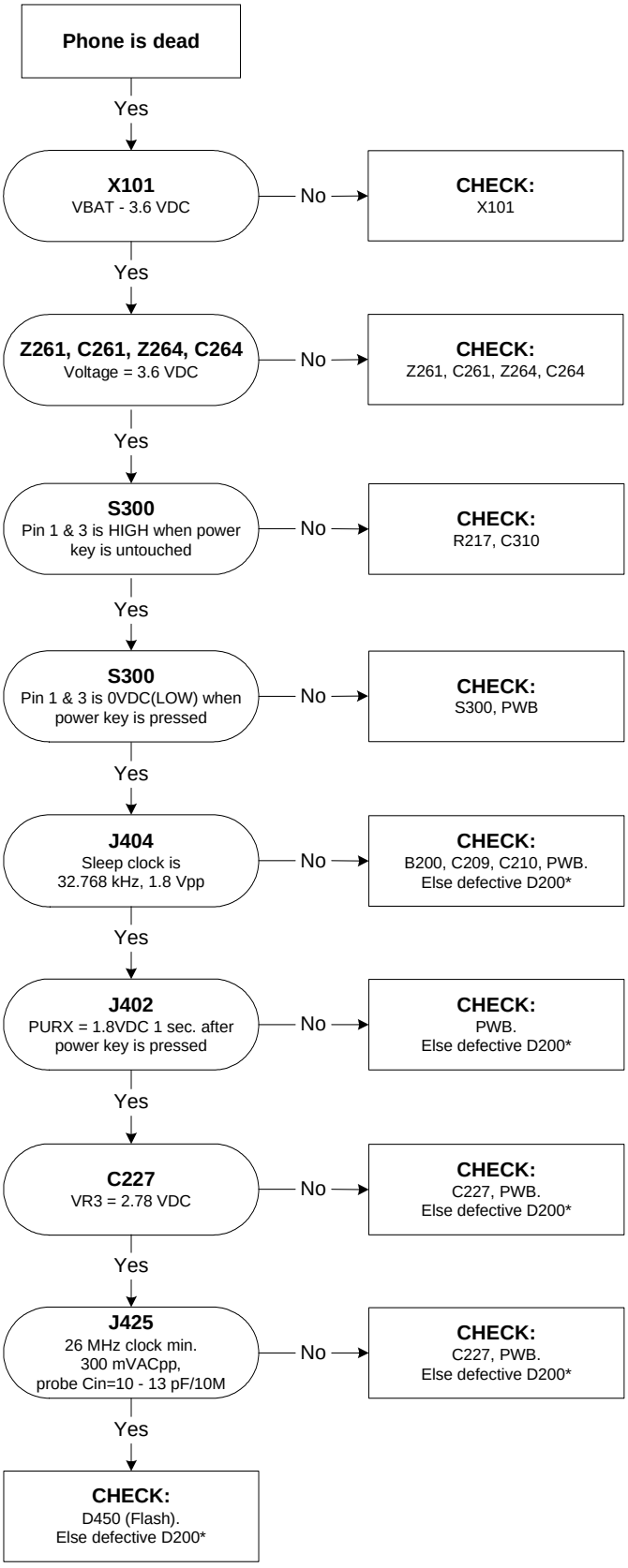

Figure 2: Phone is dead

Flash Programming Does Not Work

The flash programming can only be done via the pads on the PWB (J100).

In case of flash failure in FLALI station, the problem is most likely related to SMD problems. Possible failures could be short-circuit of balls under µBGAs (UEM, UPP, FLASH), or missing or misaligned components.

In flash programming error cases, the flash prommer can give some information about a fault. The fault information message could be "Phone doesn't set FBUS_TX line low".

Because of the use of uBGA components, it is not possible to verify if there is a short circuit in control- and address lines of MCU (UPP) and memory (flash).

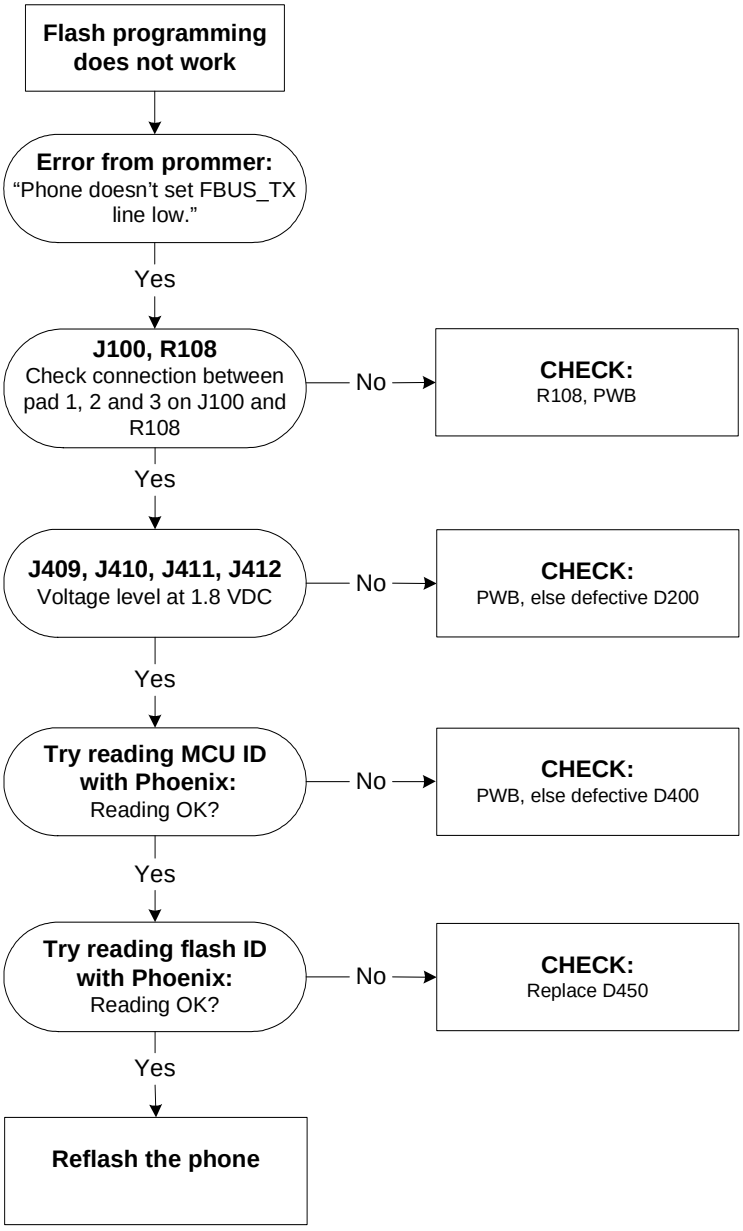
Flash programming does not work
Error from prommer: "Phone doesn't set FBUS_TX line low."
Yes
J100, R108 Check connection between pad 1, 2 and 3 on J100 and R108
No
CHECK: R108, PWB
Yes
J409, J410, J411, J412 Voltage level at 1.8 VDC
No
CHECK: PWB, else defective D200
Yes
Try reading MCU ID with Phoenix: Reading OK?
No
CHECK: PWB, else defective D400
Yes
Try reading flash ID with Phoenix: Reading OK?
No
CHECK: Replace D450
Yes
Reflash the phone

Figure 3: Flash programming does not work

©2004 Nokia Corporation Confidential

Power Does Not Stay on or Phone is Jammed

If this kind of failure is presenting itself immediately after FLALI, it is most likely caused by ASICs missing contact with the PWB.

If for some reason the MCU does not service the watchdog register within the UEM, the operations watchdog runs out after approximately 32 seconds. Unfortunately, the service routine cannot be measured.

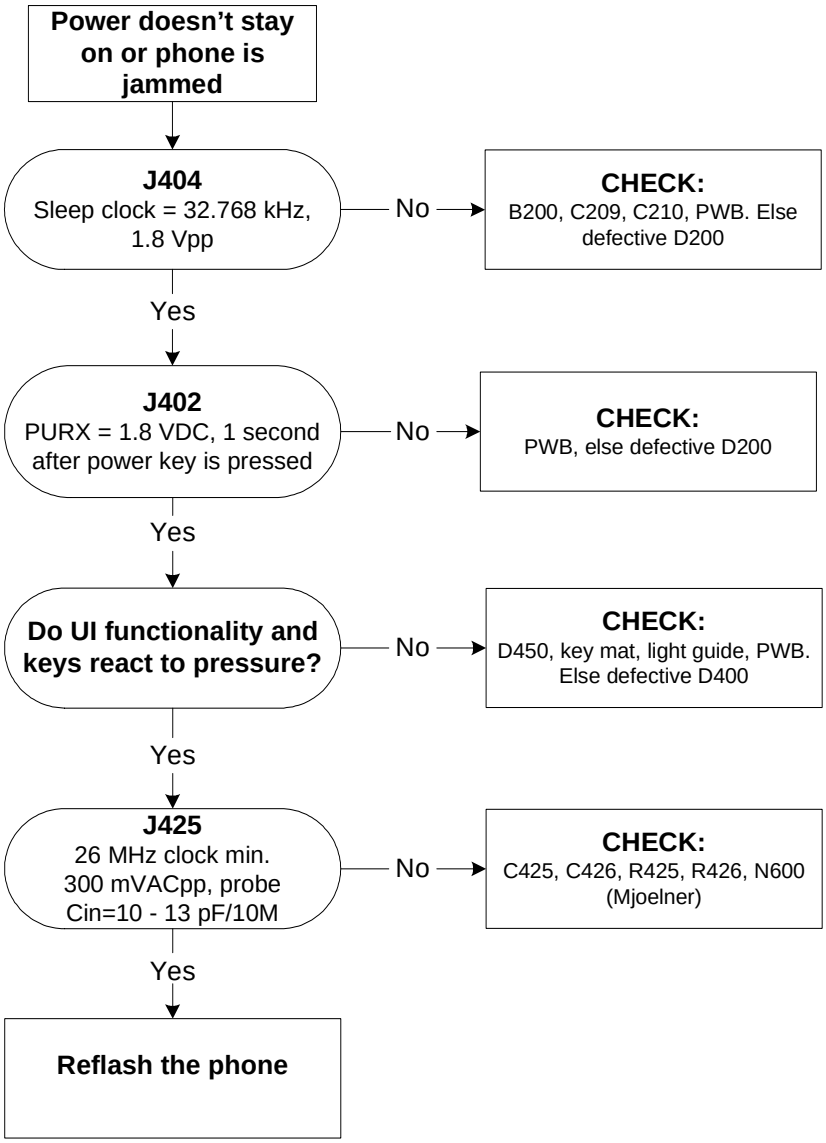

Figure 4: Power does not stay on or the phone is jammed

Display Information: "Contact Service"

This error can only happen at power up where several self-tests run. If any of these test cases fail, the display shows the "Contact Service" message.

These are individual test cases, so the following list of possible errors has no chronological order. Use common sense and experience to decide where to begin error hunting.

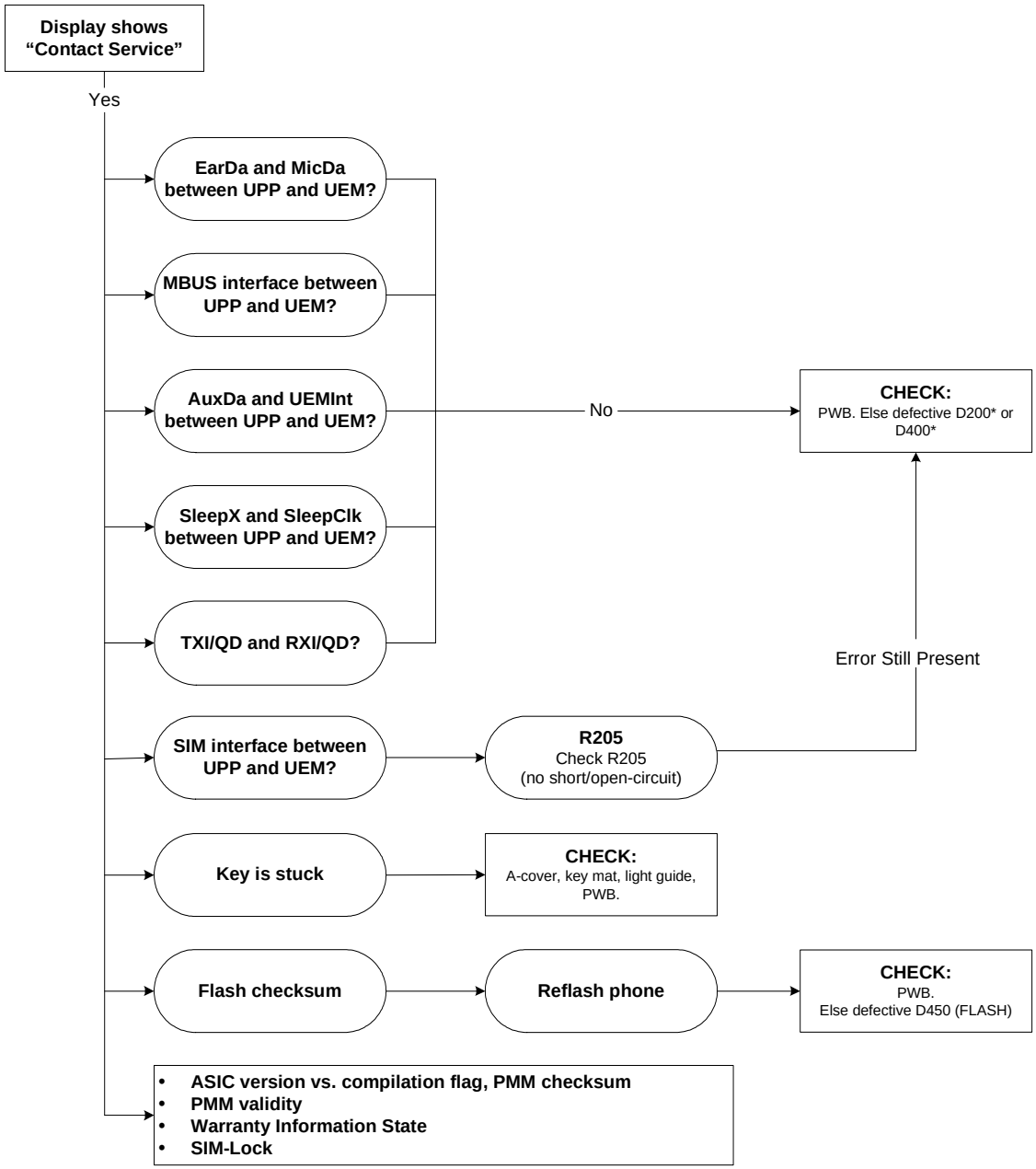
Display shows "Contact Service"
Yes
EarDa and MicDa between UPP and UEM?
MBUS interface between UPP and UEM?
AuxDa and UEMInt between UPP and UEM?
No
CHECK: PWB. Else defective D200* or D400*
SleepX and SleepClk between UPP and UEM?
TXI/QD and RXI/QD?
Error Still Present
SIM interface between UPP and UEM?
R205 Check R205 (no short/open-circuit)
Key is stuck
CHECK: A-cover, key mat, light guide, PWB.
Flash checksum
Reflash phone
CHECK: PWB. Else defective D450 (FLASH)
• ASIC version vs. compilation flag, PMM checksum
• PMM validity
• Warranty Information State
• SIM-Lock

Figure 5: Display shows "Contact Service"

©2004 Nokia Corporation Confidential

Phone Does Not Register Onto the Network, or the Phone Cannot Make a Call

If the phone does not register to the network, the fault can be in either BB or RF. Only a few signals can be tested because several signals are buried in one or more of the inner layers of the PWB. First, check that the SIM LOCK is not causing the error by using a Test-SIM card and connecting the phone to a tester.

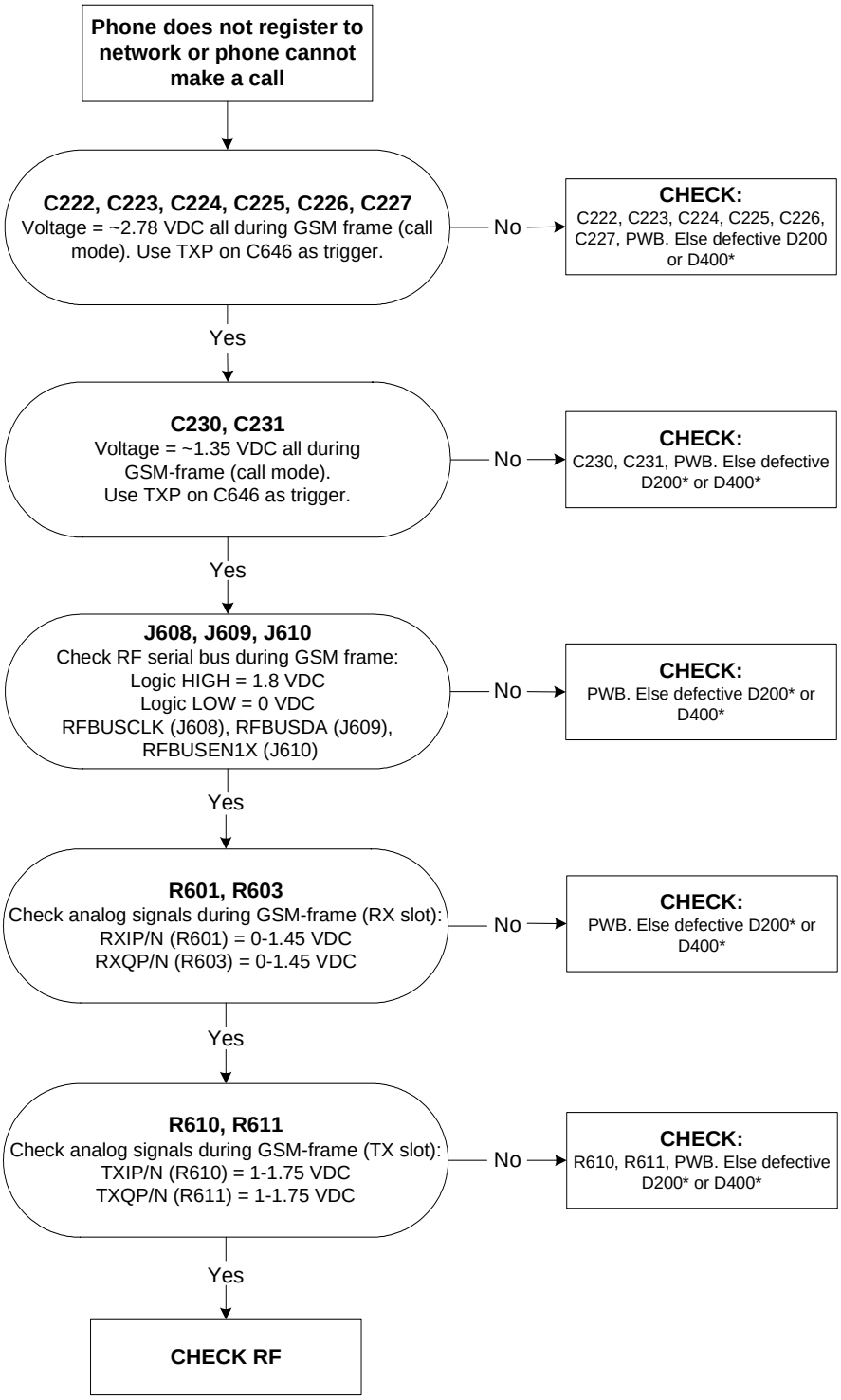
Phone does not register to network or phone cannot make a call
C222, C223, C224, C225, C226, C227
Voltage = ~2.78 VDC all during GSM frame (call mode). Use TXP on C646 as trigger.
No
CHECK:
C222, C223, C224, C225, C226, C227, PWB. Else defective D200 or D400*
Yes
C230, C231
Voltage = ~1.35 VDC all during GSM-frame (call mode).
Use TXP on C646 as trigger.
No
CHECK:
C230, C231, PWB. Else defective D200* or D400*
Yes
J608, J609, J610
Check RF serial bus during GSM frame:
Logic HIGH = 1.8 VDC
Logic LOW = 0 VDC
RFBUSCLK (J608), RFBUSDA (J609), RFBUSEN1X (J610)
No
CHECK:
PWB. Else defective D200* or D400*
Yes
R601, R603
Check analog signals during GSM-frame (RX slot):
RXIP/N (R601) = 0-1.45 VDC
RXQP/N (R603) = 0-1.45 VDC
No
CHECK:
PWB. Else defective D200* or D400*
Yes
R610, R611
Check analog signals during GSM-frame (TX slot):
TXIP/N (R610) = 1-1.75 VDC
TXQP/N (R611) = 1-1.75 VDC
No
CHECK:
R610, R611, PWB. Else defective D200* or D400*
Yes
CHECK RF

Figure 6: Phone does not register to network or phone cannot make a call

SIM-related Faults

Insert SIM Card Fault

The hardware of the SIM interface from UEM (D200) to the SIM connector (X387) can be tested without a SIM card. When the phone power is switched on, first check for a 1.8 V SIM card and then a 3 V SIM card. The phone will try this four times, whereafter it will display "Insert SIM card".

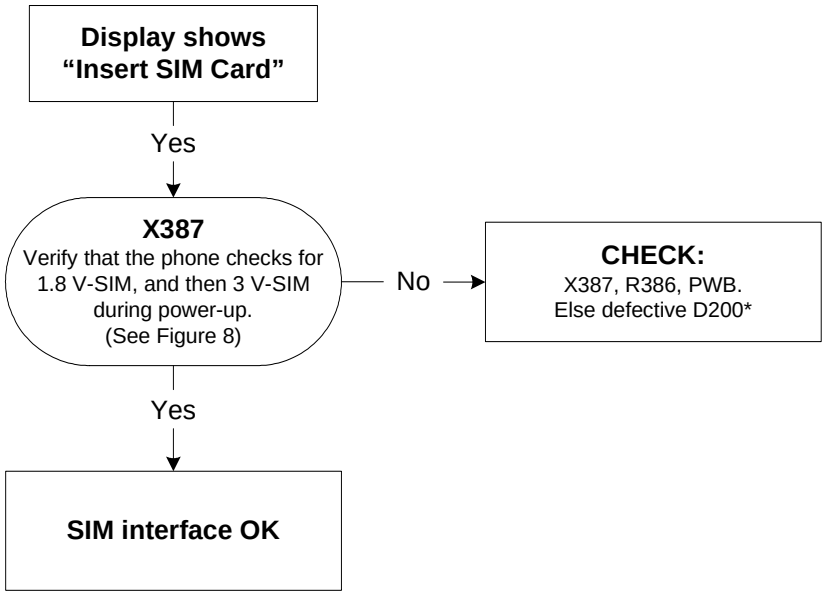

Figure 7: Display shows "Insert SIM Card"

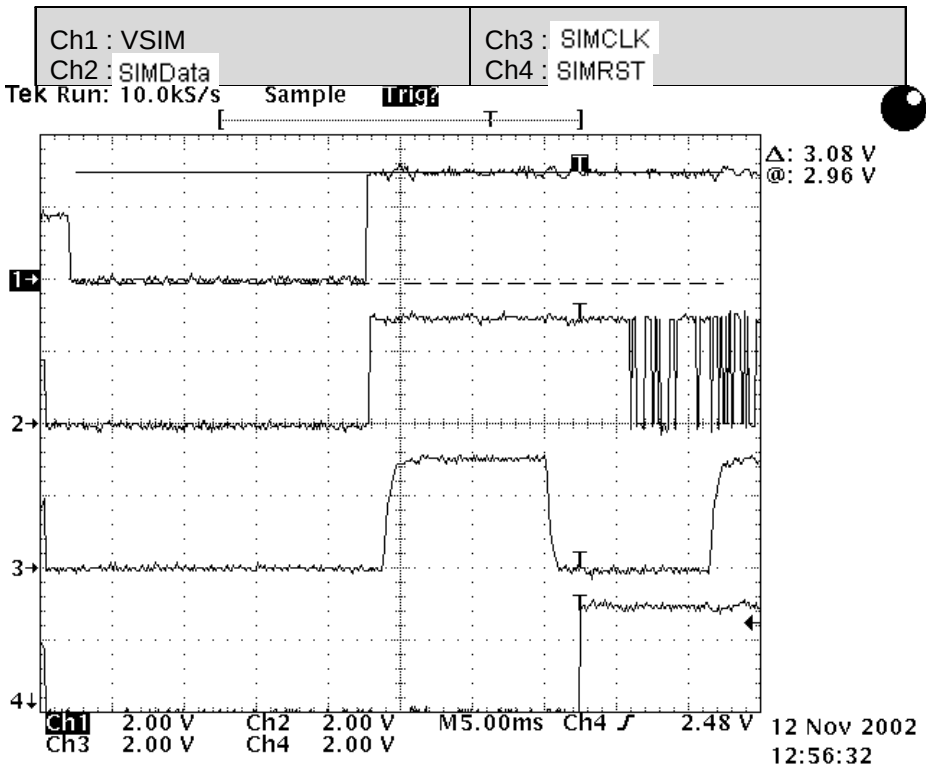

Figure 8: Checking for SIM voltage during power-up

©2004 Nokia Corporation Confidential

SIM-Card Rejected

The error "SIM Card Rejected" means that the ATR message received from the SIM card is corrupted, e.g. the data signal levels are wrong. The first data is always ATR and it is sent from the card to the phone.

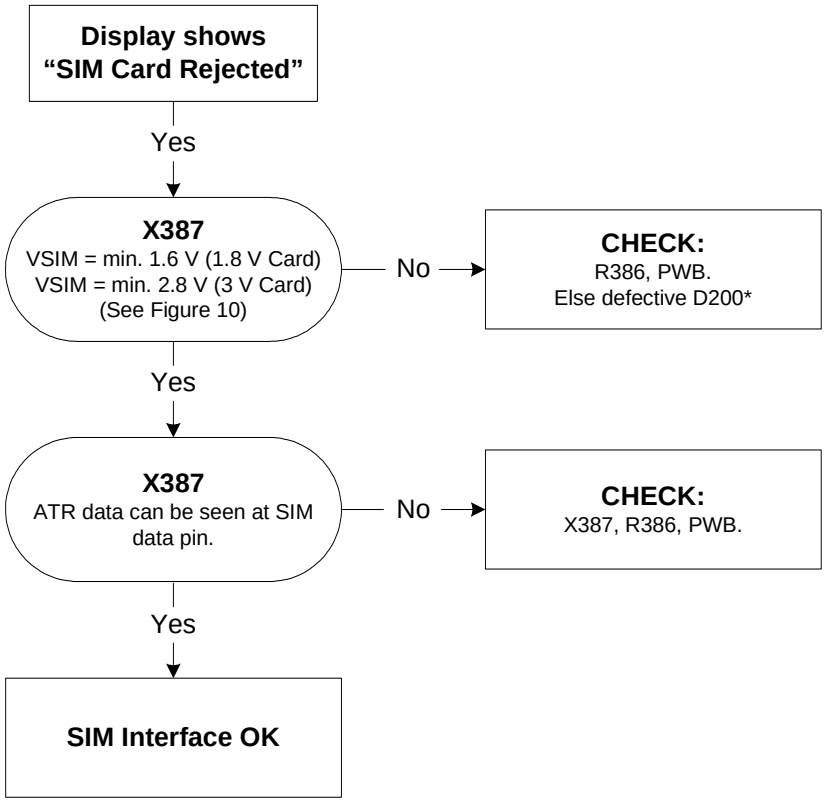

Figure 9: Display shows "SIM Card Rejected"

Figure 10 shows a normal SIM power-up.

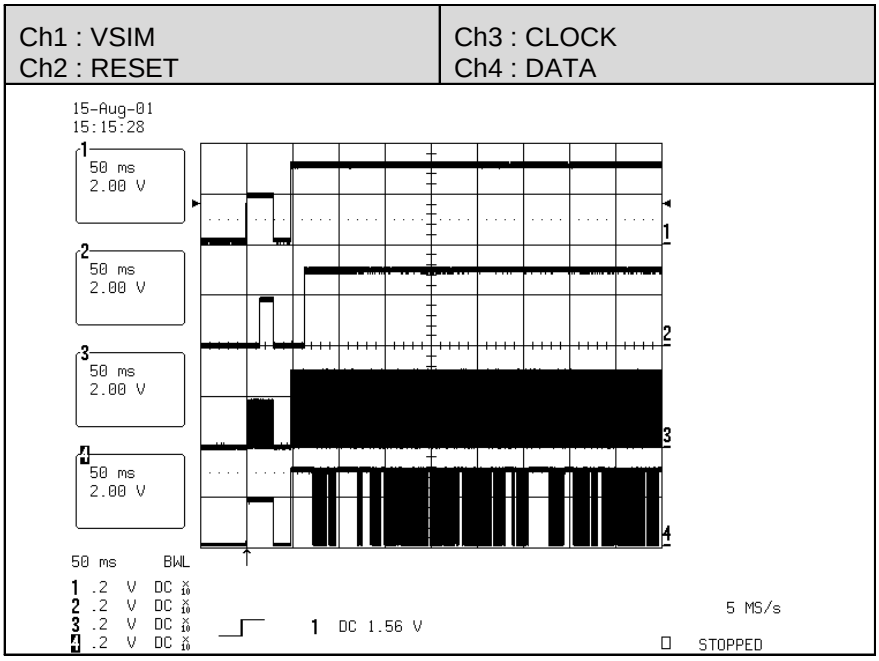

Figure 10: Normal SIM power-up sequence

©2004 Nokia Corporation Confidential

Audio-related Faults

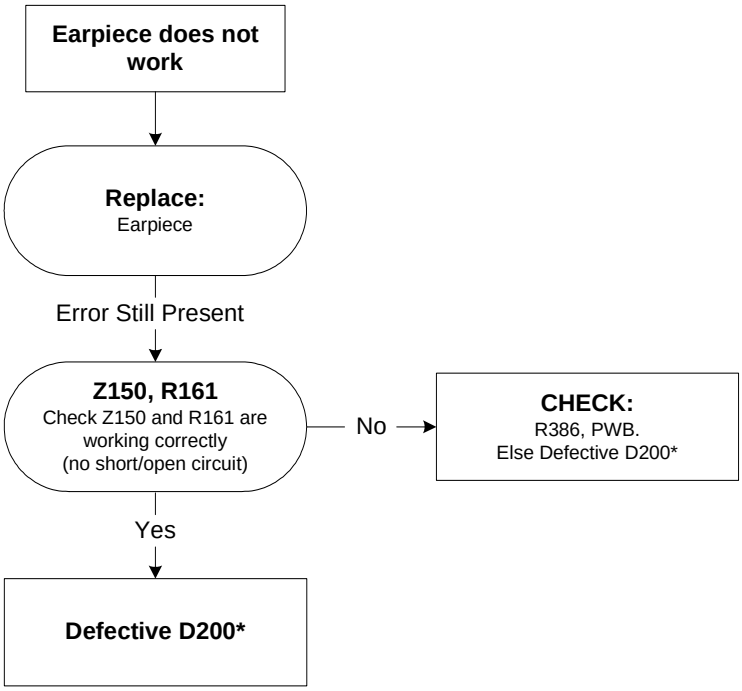

Figure 11: Earpiece does not work

©2004 Nokia Corporation Confidential

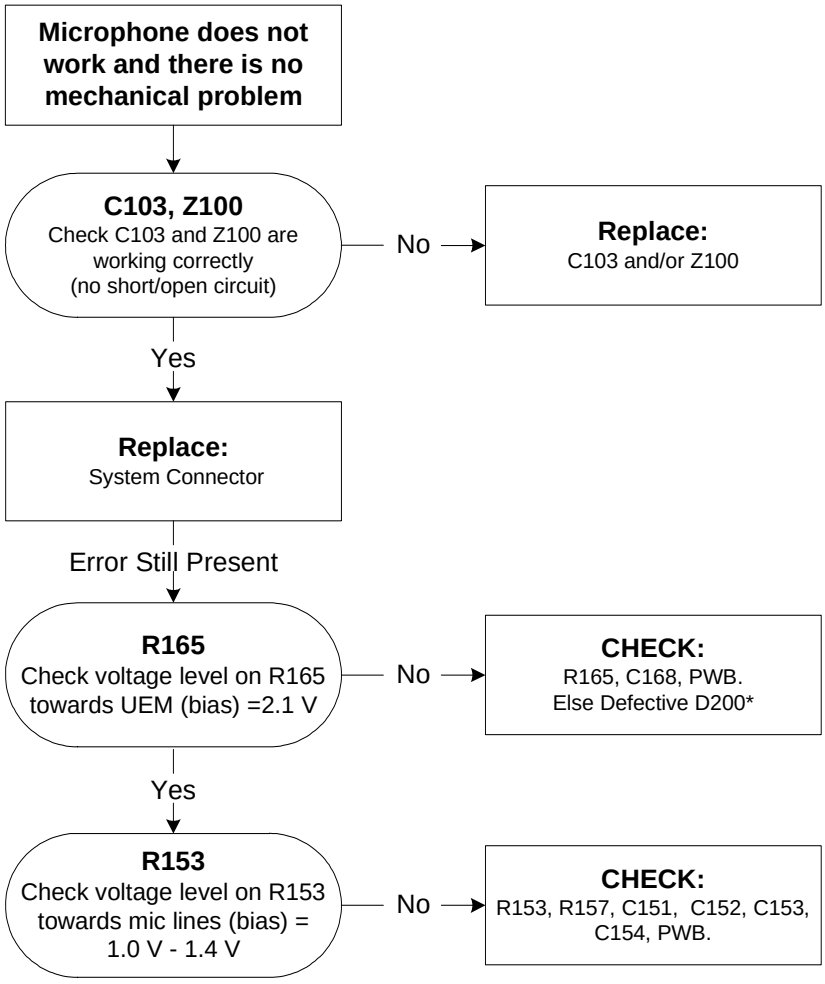

Figure 12: Microphone does not work and there is no mechanical problem

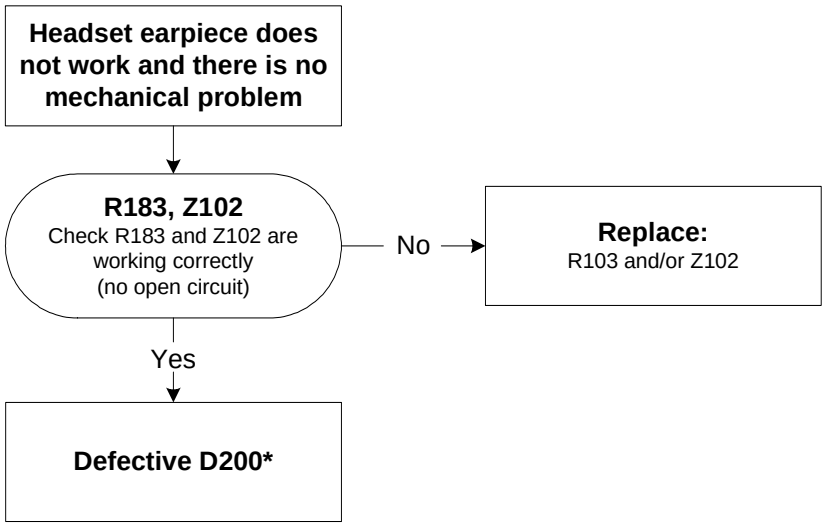

Figure 13: Headset earpiece does not work and there is no mechanical problem

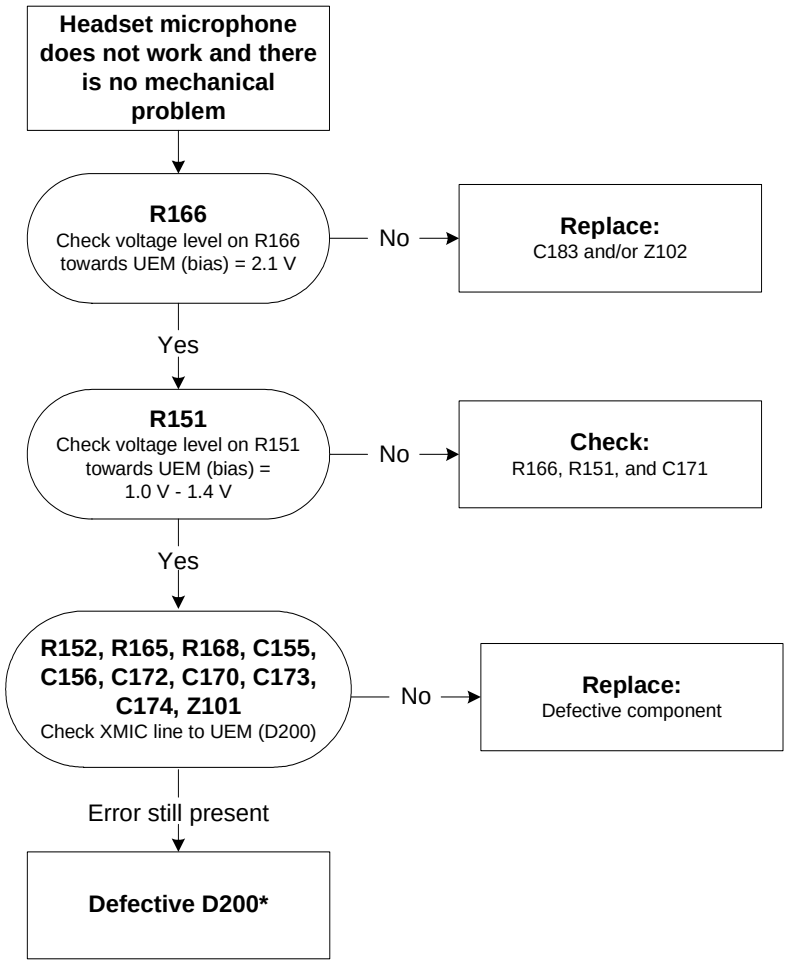

Figure 14: Headset microphone does not work and there is no mechanical problem

©2004 Nokia Corporation Confidential

Charging Failure

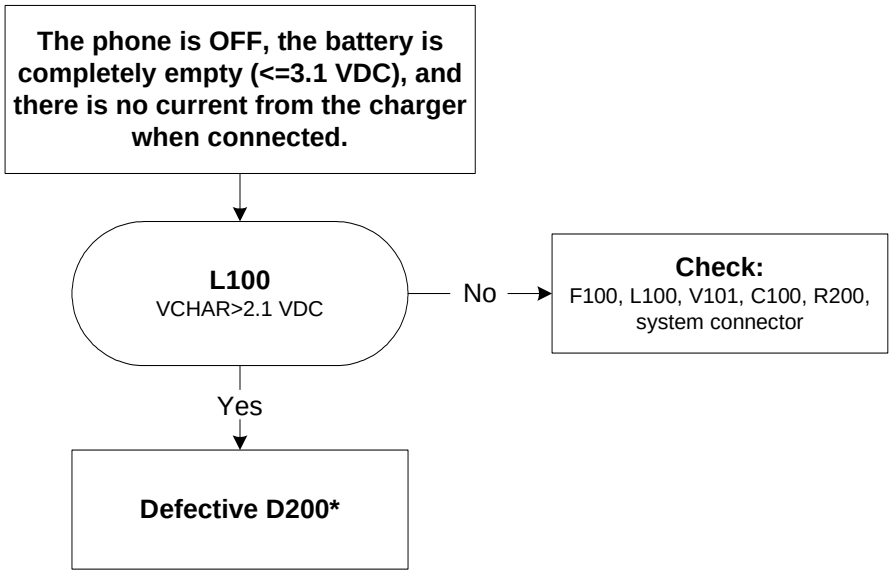

Figure 15: Phone is OFF, the battery is empty, and there is no current from the charger

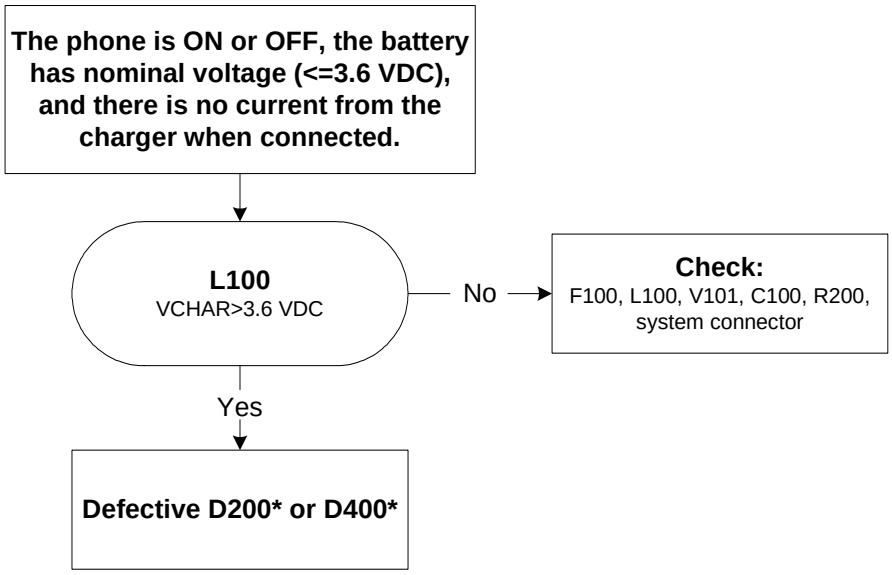

Figure 16: Phone is ON or OFF, the battery has a nominal charge, and there is no current from the charger

©2004 Nokia Corporation Confidential

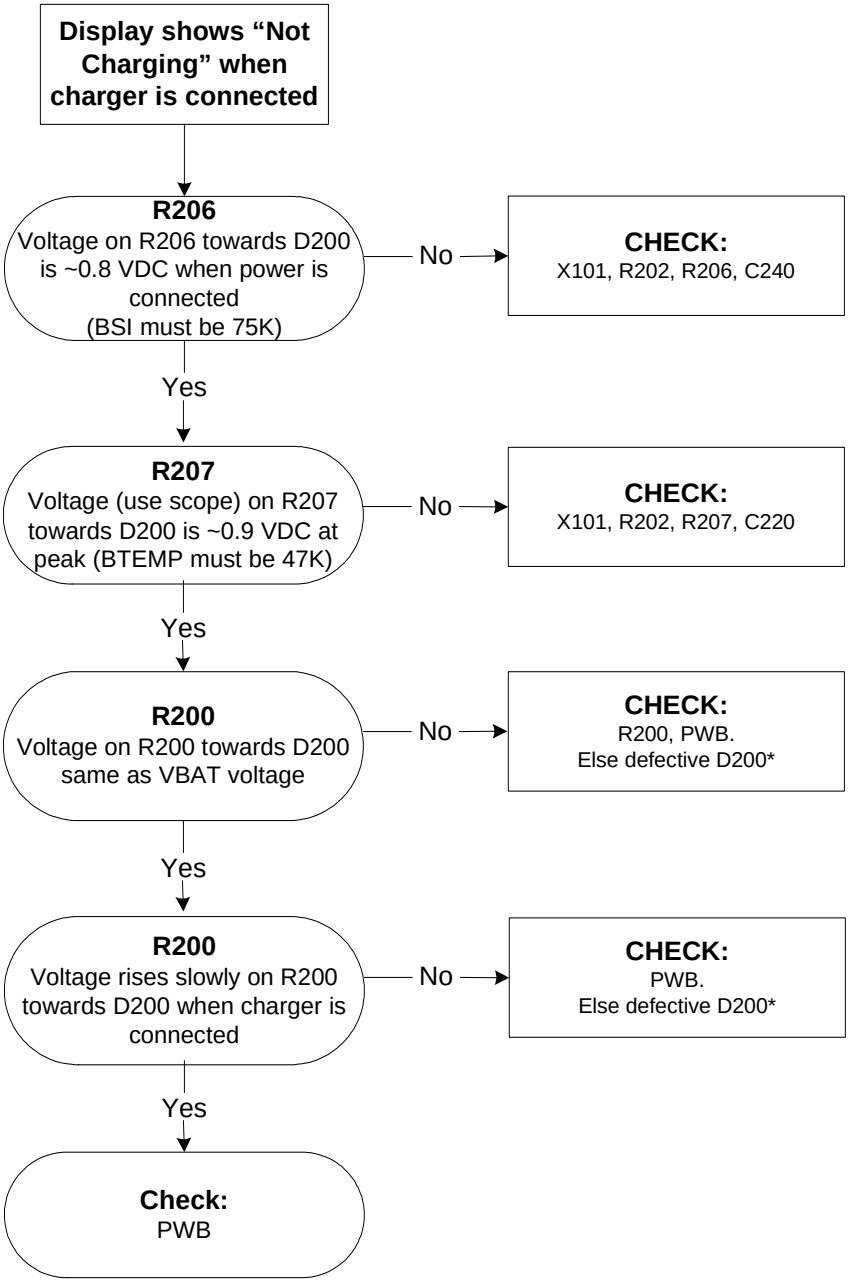

Figure 17: Display shows "Not Charging" when charger is connected

©2004 Nokia Corporation Confidential